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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Clemens Ruck

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02/24/2003

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 02/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/910,382

Applicant(s)

RUCK ET AL.

Examiner

Arnel C. Lavarias

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 06 January 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 1/6/03 in Paper No. 8 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Response to Amendment

2. The amendments to the specification of the disclosure in Paper No. 9, dated 1/6/03, are acknowledged and accepted.
3. The amendments to Claims 1-2, 7, 16-18 in Paper No. 9, dated 1/6/03, are acknowledged and accepted.
4. The amendments to the abstract of the disclosure in Paper No. 9, dated 1/6/03, are acknowledged and accepted.

Response to Arguments

5. In view of the amendments made to Claims 1-2, 7, 16-18, the objections to Claims 1-5, 8-12, 15-20 and the 35 U.S.C. 112, second paragraph, rejections to Claims 2, 17-18 are respectfully withdrawn.
6. The Applicants argue that Knowles et al. fails to teach or reasonably suggest the coarse-measuring unit comprising one or more materials having a wavelength-

dependency of reflection and/or transmission. The Examiner respectfully disagrees. It is noted that the features upon which applicant relies (i.e., dielectric filters with a coating having wavelength-dependency of characteristic properties) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Additionally, all materials inherently have wavelength-dependent reflection and/or transmission properties. Although Knowles et al. does not specifically disclose the material of the diffraction grating, typical optical materials for diffraction gratings will have wavelength-dependent reflection and/or transmission properties. Finally, it is well known in the art of diffraction that such diffraction gratings also have reflection and/or transmission properties (depending on whether the diffraction grating is a reflection or transmission type grating) that are highly dependent on the wavelength of light incident on the grating.

7. The Applicants argue that the absolute-measuring unit (atomic reference unit 90 of Knowles et al.) does not have unambiguous wavelength properties. The Examiner respectfully disagrees. Such atomic reference units are very well known in the art. The disclosed atomic reference unit is based on an iron vapor absorption cell with very specific absorption lines from which calibration may be performed (See col. 11, lines 9-29).
8. The Applicants argue that Knowles et al. fails to disclose determining in a first wavelength range a first wavelength value, determining a second wavelength range covering the first wavelength value, and determining a second wavelength value as the

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one of the plurality of different wavelength values that correspond to the measuring value in the second wavelength range. The Examiner respectfully disagrees. Knowles et al. specifically discloses determining in a first wavelength range (which by default would be the entire wavelength spectrum of interest) a first wavelength value (See col. 10, line 66-col. 11, line 2), determining a second wavelength range covering the first wavelength value (See col. 10, lines 60-65; the 20 pm range of the second wavelength range is obviously within the first wavelength range), and determining a second wavelength value as the one of the plurality of different wavelength values that correspond to the measuring value in the second wavelength range (See col. 10, line 60-col. 11, line 8).

9. The Applicants argue that Knowles et al. fails to disclose any ambiguous wavelength determination within any wavelength range. The Examiner respectfully disagrees. Knowles et al. discloses the use of an etalon, similar to that recited in the claimed invention (See col. 9, lines 44-59; col. 10, line 60-65), that also provides ambiguous wavelength determination within multiple wavelength ranges (See specifically col. 10, line 60-65, wherein the laser wavelength is determined ambiguously with a 20 pm free-spectral range which repeats over the wavelength range).

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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11. Claims 1-2, 5-10, 13-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Knowles et al.

With respect to Claims 1, 6, 10, 13, and 14, Knowles et al. discloses a wavemeter, software product, and method for determining a wavelength of an incoming optical beam (See 20 in Figure 2; Figure 6; Figure 10; col. 9, line 20-col. 11, line 29) comprising a coarse-measuring unit for determining in a first wavelength range and with a first accuracy, a first wavelength value as representing the wavelength of the incoming optical beam (See 76 in Figure 10); a fine measuring unit for providing a wavelength determination with a second accuracy for the incoming optical beam, wherein the wavelength determination is ambiguous within the first wavelength range but unambiguous in each of a plurality of unambiguous wavelength ranges, so that a plurality of different wavelength values correspond to a measuring value as measured by the fine-measuring unit for the incoming optical beam and wherein the second accuracy is higher than the first accuracy (See 84 in Figure 10); an evaluation unit for determining a second wavelength range covering the first wavelength value, and for determining a second wavelength value as the one of the plurality of different wavelength values that corresponds to the measuring value in the second wavelength range (See col. 9, line 20-col. 11, line 29); and output means for providing the second wavelength value as measuring result of the wavemeter representing the wavelength of the incoming optical beam (See col. 9, line 20-col. 11, line 29); wherein the coarse-measuring unit comprises one or more materials having a wavelength-dependency of reflection and/or transmission (See 76 in Figure 10).

With respect to Claim 2, Knowles et al. discloses the fine-measuring unit comprising means for providing a periodic wavelength dependency (See 84 in Figure 10).

With respect to Claims 5, 7, 15 and 16, Knowles et al. discloses the wavemeter further comprising an absolute-measuring unit having unambiguous wavelength properties (See 90 in Figure 10).

With respect to Claims 8-9, 17-19, Knowles et al. discloses providing a reference measurement being executed prior to determining in a first wavelength range and with a first accuracy a first wavelength value, for calibration before an actual measurement; wherein providing a reference measurement comprises sweeping an input signal over a wavelength range and analyzing a measuring result derived from sweeping an input signal over a wavelength range (See 90 in Figure 10; col. 11, lines 9-29).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al. in view of Cargill et al. and Fowles.

Knowles et al. discloses the invention as set forth above in Claims 1 and 6. Knowles et al. lacks the coarse-measuring unit comprising a glass plate with a dielectric coating having one or more layers of materials, chosen from the group of MgF_2 , SiO_2 , or CeF_3 , on one side and an anti-reflection coating on another side, thus representing a wavelength-dependent beamsplitter. However, Cargill et al. teaches a spectral wavelength discrimination system for accurately determining the wavelength of a beam of radiation (See Figure 2C) wherein the system utilizes a wavelength-dependent beamsplitter (See 34 in Figure 2C), such as a glass plate with alternating layers of SiO_2 and TiO_2 (See col. 5, lines 1-59; Figure 3; Table 1). Additionally, Fowles teaches that anti-reflecting films can be formed on a glass substrate surface, such as on glass lenses, to reduce the amount of light reflected from the glass surface (i.e. anti-reflecting films). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a wavelength-dependent beamsplitter made for example from a glass plate with alternating dielectric layers and an anti-reflecting film, as taught by both Cargill et al. and Fowles, in the wavemeter for determining a wavelength of an incoming optical beam as disclosed by Knowles et al. One would have been motivated to incorporate a wavelength-dependent beamsplitter to reduce the system cost since such beamsplitters are inexpensive. One would have been motivated to provide an anti-reflecting film on the wavelength-dependent beamsplitter to increase the overall optical throughput of the system, thus increasing signal-to-noise ratio and wavelength determination accuracy.

14. Claims 11, 12, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al. in view of Vry et al.

Knowles et al. discloses the invention as set forth above in Claims 1 and 6. Knowles et al. lacks determining the second wavelength range as a wavelength range around the first wavelength range, wherein the second wavelength range is determined by adding and subtracting a value corresponding to half of the period of the unambiguous wavelength range covering the first wavelength value, to and from the first wavelength value. However, Vry et al. teaches a method for determining unambiguously the exact wavelength of a beam (See Abstract; Figure 1) by determining a first coarse wavelength range using measured properties of air, then determining a second wavelength range from the first wavelength range based on the measured and calculated characteristics and free-spectral range of the Fabry-Perot interferometer (See Page 3, line 9-Page 4, line 9). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the second wavelength range as a wavelength range around the first wavelength range, as taught by Vry et al., in the wavemeter and method for determining a wavelength of an incoming optical beam as disclosed by Knowles et al. One would have been motivated to do this to provide increased accuracy of the wavelength of the beam of light under test.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6043883 to Leckel et al.

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Newly discovered reference to Leckel et al. (U.S. Patent No. 6043883) discloses a wavemeter and apparatus for adjusting the wavelength of a laser source (See Figures 1 and 2). In particular, Leckel et al. discloses a wavemeter comprising a measuring unit for providing a wavelength determination with a given accuracy for the incoming optical beam, wherein the wavelength determination is ambiguous within a first wavelength range but unambiguous in each of a plurality of unambiguous wavelength ranges, so that a plurality of different wavelength values correspond to a measuring value as measured by the measuring unit for the incoming optical beam (See Figures 1, 3, 5-7; col. 6, line 3-col. 9, line 58). However, Leckel et al. lacks a second measuring unit for determining in the first wavelength range, a first wavelength value as representing the wavelength of the incoming optical beam, and wherein the coarse-measuring unit comprises one or more materials having a wavelength-dependency of reflection and/or transmission.

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias
February 19, 2003

